

**AMEND THE ABSTRACT AS FOLLOWS:**

ABSTRACT

(Fig. 4)

A method of fault classification in a plasma process chamber powered by an RF source ~~comprises~~ includes initially running a plurality of different baseline plasma processes on the chamber. For each baseline process, the magnitudes of a plurality of Fourier components of delivered RF power are determined and stored as an impedance fingerprint for that baseline process. In the case of a fault, one or more of the baseline processes is repeated according to a predetermined decision tree to determine the current fingerprints and classify the fault by comparing the current fingerprints with the original fingerprints.